

Steroid And Non-Steroid Bodybuilder Classification Using Deep Learning



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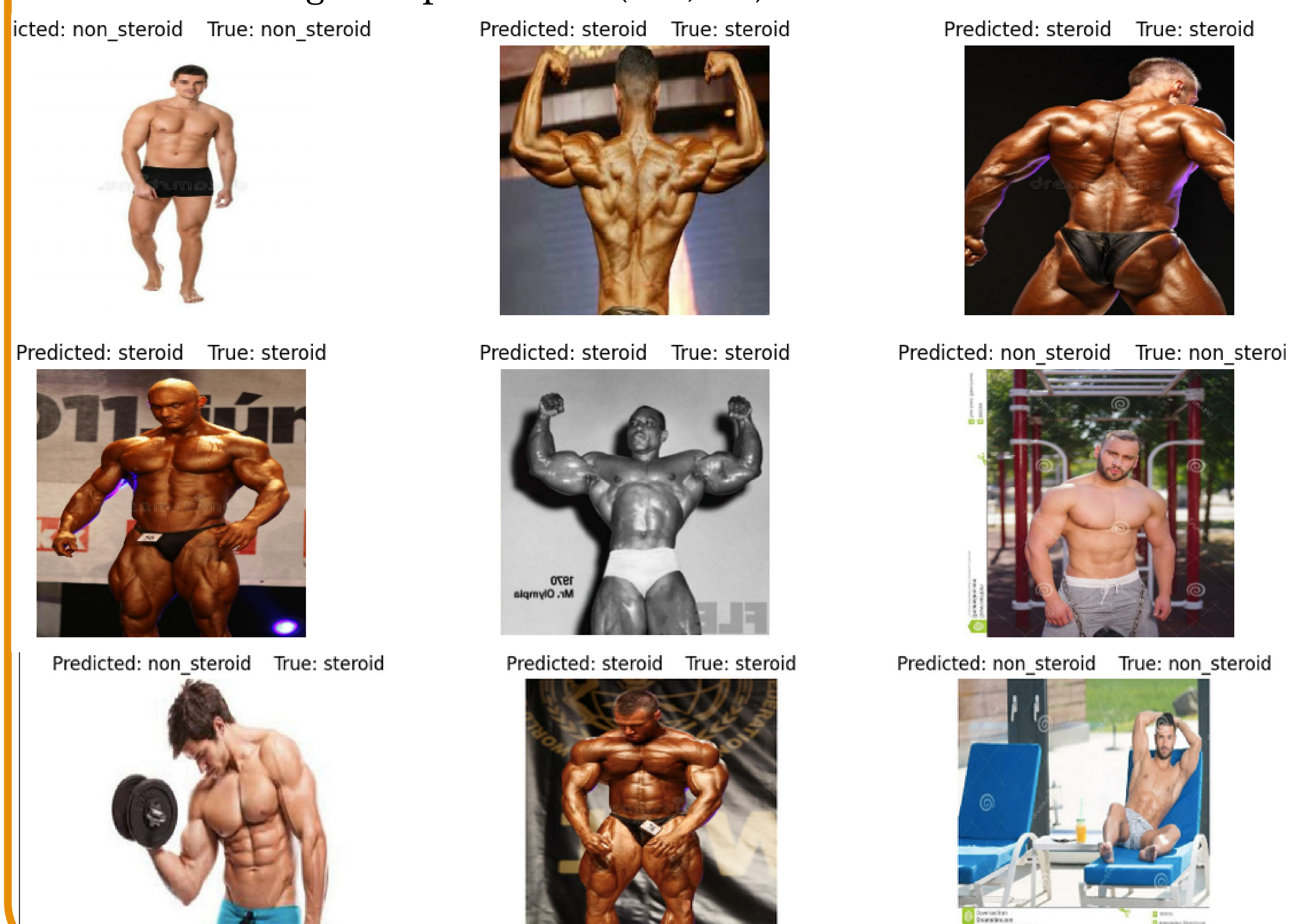
Introduction

In the sports of Bodybuilding illegal steroid use is a very widespread issue. Hence, a universal steroid use detection Machine Learning system can provide a dope-testing alternative for sports organization committees to prevent unfair competitive advantages, related severe health risks and extensive wait times for chemical lab tests. For this we will apply a Deep learning image classification system for a non-steroid and steroid bodybuilder image dataset, which has to be created from scratch and a WebApp to provide a User Interface for easy access.

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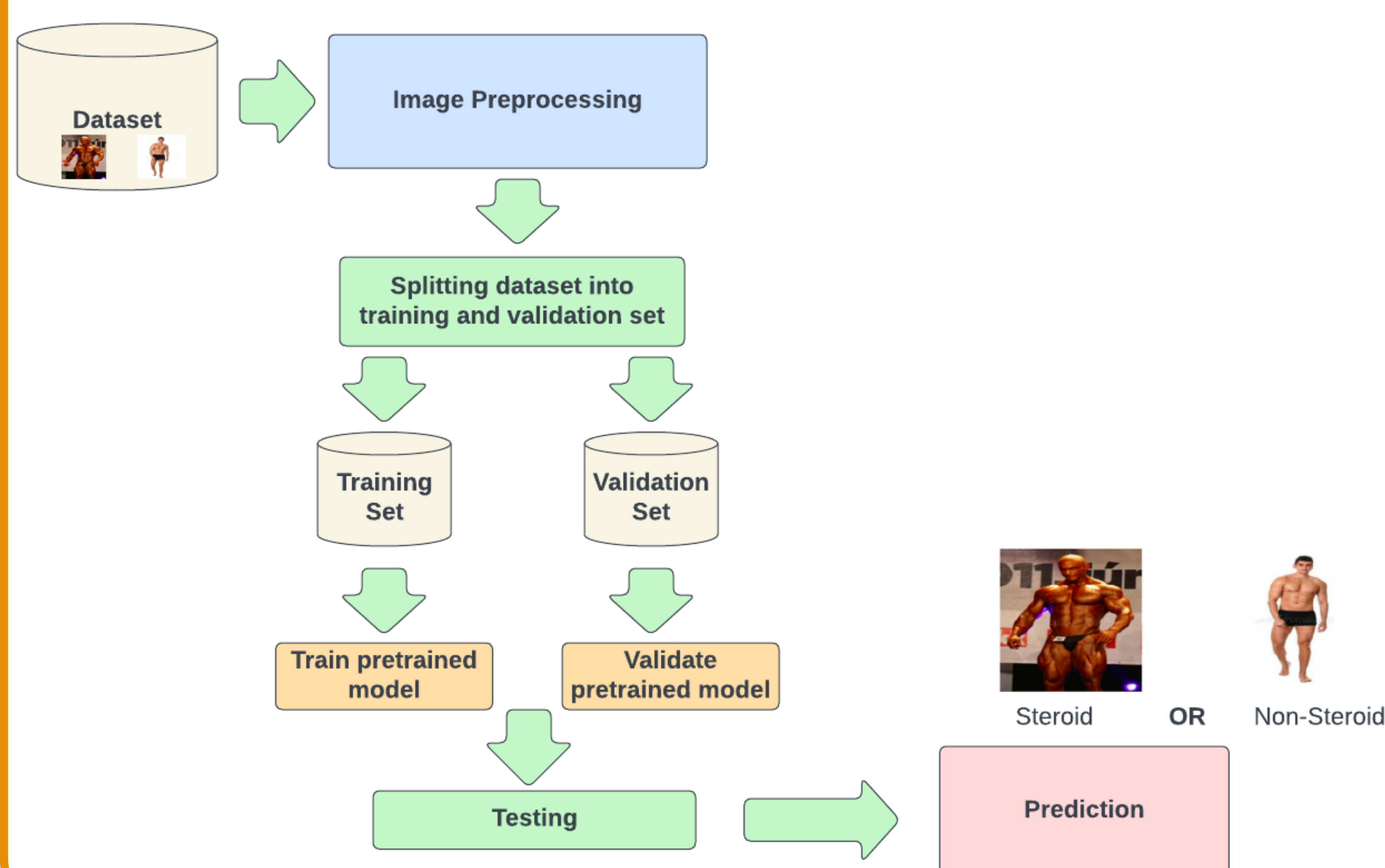
Dataset

Our dataset contains 2076 Non-Steroid RGB image samples and 2155 Steroid RGB image samples of size (224,224).



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Block Diagram



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Graphs

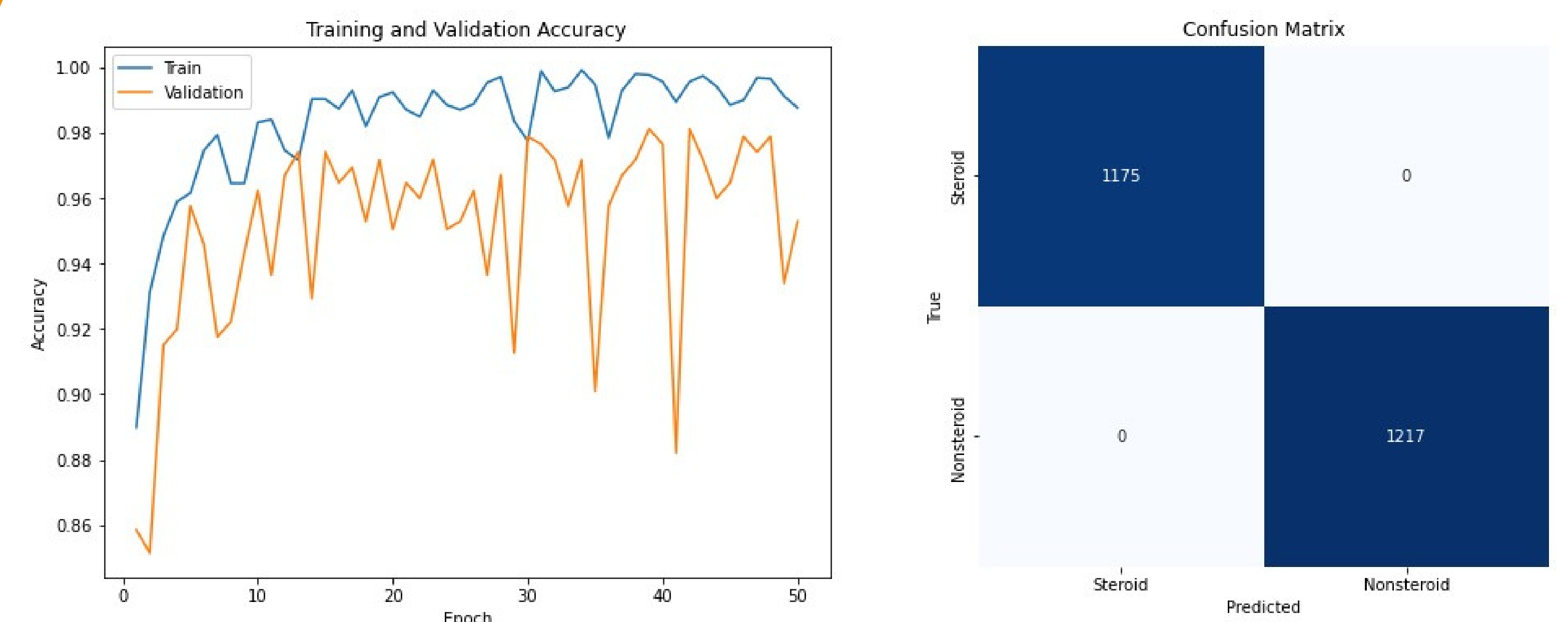


Fig 01: Training and Validation Accuracy Graph and Confusion Matrix for DenseNet121 Model (Best Accuracy).

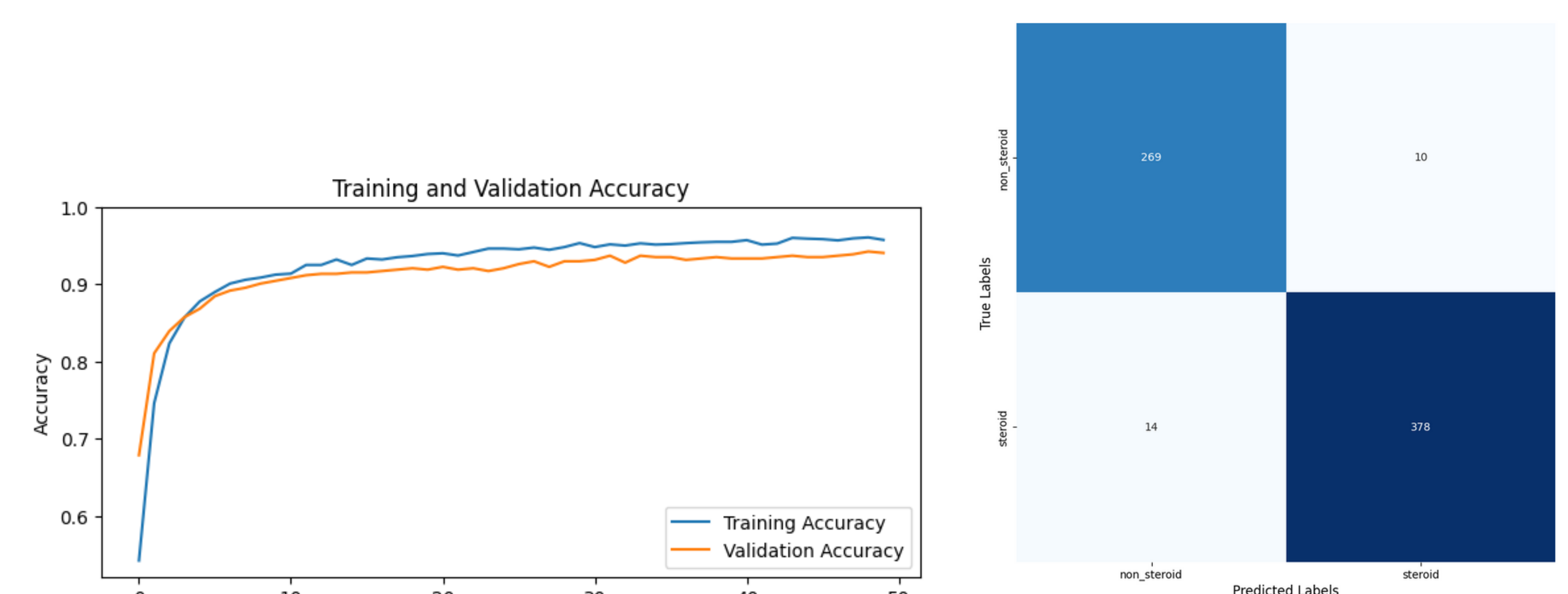
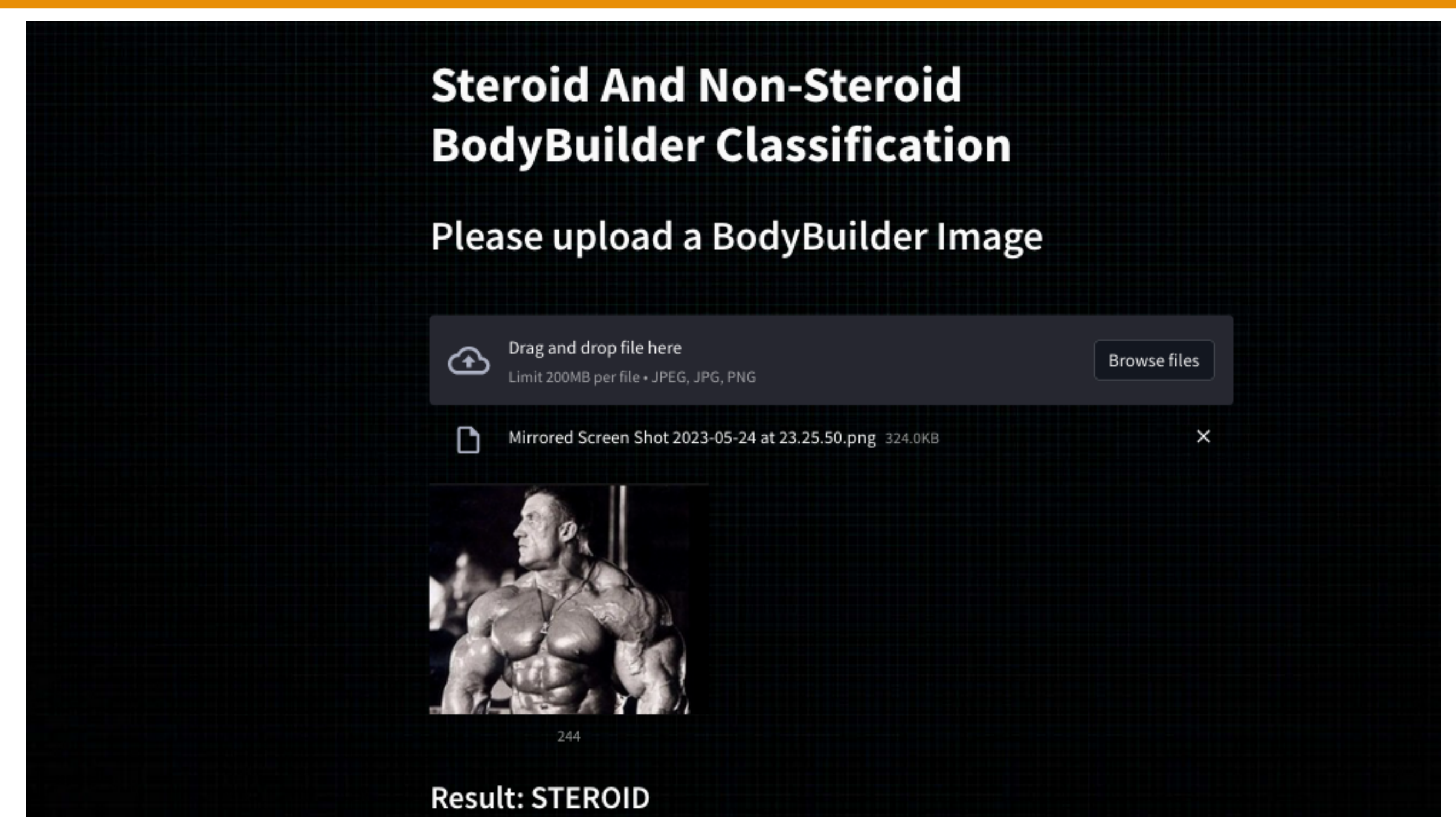


Fig 02: Training and Validation Accuracy Graph and Confusion Matrix for InceptionNetV3 Model (2nd Best Accuracy).

5

WebApp



This Webapp was created on StreamLit and is compatible on both desktop and mobile devices.

6

Conclusion

We were able to create a large enough RGB dataset of 4,231 images of steroid and non-steroid body builder images. Next, we trained 4 different Deep Learning models, with the highest accuracy being a good 99.20% for DenseNet121 model. Lastly, using the DenseNet121 model we created a StreamLit WebApp as a UserInterface for simple customer use. Thus, creating a fully built system able to work as a primary dope test for bodybuilders using steroids.